IN THE CLAIMS:

Please amend the claims as follows. The claims are in the format as required by 35 C.F.R. § 1.121.

1. **(Original)** An interface for a capacitance diaphragm sensor (CDS) comprising:
a differencing current transformer having at least one primary winding which is coupled to a port of the CDS;

a charge amplifier coupled to a secondary winding of the current transformer and configured to amplify a signal induced on the secondary winding of the current transformer;

a conductive shielding structure positioned around the current transformer and the amplifier;

a common mode transformer having a first winding coupled to receive the amplified signal from the charge amplifier;

an excitation voltage source, wherein the excitation voltage source is coupled to the primary winding of the current transformer and configured to supply an excitation voltage to the port, wherein the excitation voltage source is further coupled to a second winding of the common mode transformer, and wherein the excitation voltage source is further coupled to the shielding structure; and

a synchronous detector coupled to the first winding of the common mode transformer and configured to produce a signal voltage corresponding to the differential capacitance of the CDS.

2. **(Currently Amended)** The interface of claim 1, wherein the current transformer has two primary windings, each of which is coupled between the excitation voltage source and a corresponding capacitive circuit of the CDS ~~differential capacitance manometer~~.

3. **(Currently Amended)** The interface of claim 1, wherein the shielding structure further comprises conductive sleeves around a pair of leads between the interface and the CDS ~~differential capacitance manometer~~.

4. **(Original)** The interface of claim 1, wherein the current transformer has a toroidal core.

5. **(Original)** The interface of claim 1, wherein the common mode transformer has a toroidal core.

6. **(Original)** The interface of claim 1, wherein both the current transformer and the common mode transformer have toroidal cores, wherein the axes of symmetry of the current transformer and the common mode transformer are orthogonal to each other.

7. **(Original)** The interface of claim 1, wherein the excitation voltage source is configured to produce a sinusoidal voltage.

8. **(Original)** A device comprising:

a differencing current transformer having one or more primary windings configured to be coupled between a first voltage source and a pair of circuits, wherein current flowing through the one or more primary windings to a first one of the pair of circuits generates a first magnetomotive force (MMF) and wherein current flowing through the one or more primary windings to a second one of the pair of circuits generates a second MMF which is opposite in polarity to the first MMF and wherein the net of the first and second MMFs induces a current on a secondary winding of the differencing current transformer proportional to the difference between the first and second MMFs; and

an amplifier coupled to the secondary winding of the differencing current transformer and configured to amplify a difference signal corresponding to the current induced on the secondary winding of the differencing current transformer.

9. **(Original)** The device of claim 8, wherein the amplifier comprises a charge amplifier.

10. **(Currently Amended)** The device of claim 8, wherein the one or more primary windings comprise a single, center-tapped primary winding, wherein the a center-tap of the center-tapped primary winding is configured to be coupled to the first voltage source and the ends of the primary winding are configured to be coupled to the pair of circuits.

11. **(Currently Amended)** The device of claim 8, wherein the one or more primary windings comprise a pair of primary windings, wherein a first end of each of the pair of primary windings

is configured to be coupled to the first voltage source and wherein a second end of each of the pair of primary windings is configured to be coupled to ground.

12. **(Original)** The device of claim 8, wherein the first voltage source is configured to generate a sinusoidal excitation voltage.

13. **(Original)** The device of claim 8, further comprising a shielding structure wherein the shielding structure is configured to carry a guard voltage equal to the voltage of the first voltage source.

14. **(Original)** The device of claim 13, wherein the first voltage source is configured to generate a sinusoidal excitation voltage.

15. **(Original)** The device of claim 8, wherein the pair of circuits comprise a pair of capacitive circuits of a differential capacitance manometer.

16. **(Currently Amended)** The device of claim 8, further comprising a common mode transformer having a first winding coupled to receive the amplified signal from the ~~charge~~ amplifier and a second winding configured to be coupled to a guard voltage source.

17. **(Currently Amended)** The device of claim 16, wherein the guard voltage source comprises the first voltage source ~~8, further comprising an excitation voltage source, wherein the excitation voltage source is coupled to the primary winding of the current transformer and configured to supply an excitation voltage to the port, and wherein the excitation voltage source is further coupled to a secondary winding of the common mode transformer~~.

18. **(Currently Amended)** The device of claim 17 ~~8~~, further comprising a synchronous detector coupled to the ~~excitation~~ first voltage source and coupled to a ground referenced output from the amplifier and configured to produce a DC signal voltage corresponding to an imbalance in impedances at the one or more primary windings of the current transformer.

19. **(Original)** The device of claim 8, further comprising a differential capacitance manometer.

20. **(Original)** The device of claim 8, wherein the differencing current transformer comprises a low-impedance current transformer.

21. **(Currently Amended)** The device of claim 9 ~~8~~, further comprising one or more power supplying amplifiers and an amplifier having high common-mode rejection, wherein the high common mode rejection amplifier is coupled to receive the amplified signal from the charge amplifier and is also configured to be coupled to a guard voltage source.

22. **(Original)** A method for measuring current differential comprising:
coupling one or more primary windings of a current transformer to each of a pair of circuits in which a current differential is to be measured, wherein the current in each circuit generates an magnetomotive force (EMF) which is out of phase with the current in the other circuit;
coupling a secondary winding of the current transformer to an amplifier;
amplifying a signal induced on the secondary winding of the current transformer; and
generating an amplified signal corresponding to the signal induced on the secondary winding of the current transformer.

23. **(Original)** The method of claim 22, wherein the signal induced on the secondary winding of the current transformer comprises an alternating current (AC) signal and wherein the method further comprises rectifying the signal to produce a direct current (DC) signal.

24. **(Original)** The method of claim 22, wherein the amplified signal includes a component corresponding to a guard voltage, wherein the method further comprises removing the component corresponding to the guard voltage.

25. **(Currently Amended)** The method of claim 24, wherein removing the component corresponding to the guard voltage comprises passing the amplified signal through a first winding of a common mode transformer, wherein the guard voltage is applied to a second winding of the common mode transformer.

26. **(Original)** The method of claim 22, wherein the one or more primary windings of the current transformer comprise a single, center-tapped primary winding, wherein each of the pair

of circuits in which the current differential is to be measured is connected to an opposite end of the primary winding and wherein the method further comprises applying an excitation voltage to the center tap of the primary winding.

27. **(Original)** The method of claim 26, wherein the electrical impedance of the portion of the primary winding between ~~the excitation~~ a source of the excitation voltage and one of the pair of circuits is substantially equal to the electrical impedance of the portion of the primary winding between the excitation source and the other of the pair of circuits.

28. **(Original)** The method of claim 22, wherein generating the amplified signal corresponding to the signal induced on the secondary winding of the current transformer comprises coupling the secondary winding to a charge amplifier.

29. **(Currently Amended)** The method of claim 22, further comprising passing the amplified signal through a synchronous detector.

30. **(Original)** The method of claim 29, wherein the synchronous detector is coupled to an excitation source.

31. **(Original)** The method of claim 22, further comprising providing a guard voltage surrounding the current transformer and amplifier.

32. **(Original)** The method of claim 31, wherein the guard voltage comprises a voltage applied to each of the one or more primary windings of the current transformer.

33. **(Original)** The method of claim 32, wherein the amplifier is referenced to the guard voltage.